

Assistant Director, Research and Reports  
 Thru : Chief, Analysis Division  
 A/C

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## Preliminary Evaluation of Aggregate Time Series in NIE-65.

1. In the process of assembling the production estimates contributed by D/M, D/I, and D/S analysts, A/C has aggregated the heterogeneous statistics into two types of time series. Initially individual commodity estimates were combined into industry time series, for example, the derivation of a chemical index from estimated outputs of several chemical products. At their level of aggregation the weights were official Soviet prices of the respective items. After industry time series had been obtained, they in turn were aggregated into even broader indexes of overall industrial production, producer goods production, and consumer goods production. For this higher level of aggregation the sector weights are based on the "value-added" figures used in the Rand 1941 Input-Output Table.<sup>1/</sup> The balance of the discussion is concerned with this higher level of aggregation.

2. In the following table are shown ORR indexes of civilian production for 1939-1951 and civilian plus military production for 1947-1951. The estimates of military output are derived from the major military procurement figures computed by Heymann in Rand RM-746.<sup>2/</sup> Heymann's figures have been expressed in 1949 prices, as were commodity values for civilian production, and converted into a time series based on 1948. With proper weighting the defense industry index was then incorporated into the general index. An official Soviet time series of civilian and military production has been introduced as a basis of comparison.

Total USSR Industrial Production (1948 = 100)

Year	ORR	ORR	Official USSR
	Civilian Production	Civilian and Military Production	Civilian and Military Production
1939	90		
1940	94		
1941	76		
1942	53		
1943	48		
1944	51		
1945	56		78
1946	69		65
1947	84	83	79
1948	100	100	100
1949	117	117	119
1950	135	140	147
1951	148	163	177

<sup>1/</sup> RM-924 "A Tentative Input-Output Table for the USSR, 1941 Plan," Rand, p.7, Restr.

<sup>2/</sup> Hans Heymann, Jr. The Magnitude of Russia's Military Effort, RM-746, Rand, p.39.

3. Several pertinent questions arise as to the validity of the ORR index. A partial solution will be sought by making comparison with official figures, previous ORR estimates, and estimates made by other members of the intelligence community. It is obvious that the official index is inclusive of military production, otherwise there would have been no decline in production during 1946. The official producer goods ~~series~~<sup>index</sup> exhibits a similar trend. Therefore, the comparison must be between ORR and official estimates of combined defense and non-defense output. Beginning with 1948, the two series show similar trends, but with a larger growth rate indicated by the official series. Most likely the higher official index can be explained by the Soviet statistical practice of entering now more complex products into an index at their current prices, whereas the ORR index is based on constant 1949 prices.

4. The acceleration of military output in 1950 and 1951 is apparent by comparing the civilian series with the combined series. In 1950, the rise in civilian production amounted to 15 percent, while combined production rose by 22 percent. In 1951 the difference is equally apparent with respective increases of 9 percent and 16 percent. Since the official index indicates a rise in combined production of only 10 percent in 1952 as compared with 17 percent in 1951, ORR figures if available would show a further decline in the rate of growth for both civilian and combined civilian and military production.

5. At first glance the ORR aggregate production estimates appeared distressingly high as compared with a previous ORR position. In NIE-64 it was estimated that total output had increased 20-30 percent in the period 1948-1951. By contrast preliminary NIE-65 figures indicate a 48 percent increase in the same period for civilian production and a 63 percent rise if military output is included. How to reconcile those widely divergent estimates?

The NIE-64 estimate was based on the generally accepted belief the GNP in the USSR rise by 6-7 percent per annum. Actually industrial production accounts for only 30-40 percent of total gross national product. If account is taken of the fact that the other elements of GNP, such as agriculture, social services, and personal services, are growing at a rate well below that of industrial output, it is apparent that the rates of increase in industrial output and GNP can be widely divergent.

6. The ORR estimate is in substantial agreement with those made by other specialists in Soviet economic matters. Professor Hodgman<sup>1/</sup> estimates growth in civilian production from 1948 to 1951 amounted to 59 percent. This figure is considerably above the ORR civilian output figure of 48 percent and almost agreed to the ORR combined output figure of 63 percent.

<sup>1/</sup> Hodgman, Donald, Trends in Soviet Industrial Production, p.23. Unpublished manuscript prepared for Conference on Soviet Economic Growth.

Thus, our estimate does not appear to be inordinately large.

Norman Kaplan<sup>1/</sup> takes the official figures and subjects them to detailed analysis. He concludes that there is little basis for deflating official Soviet claims. As will be recalled from the accompanying table, official rates of increase exceed those derived by ORR.

As a third check ORR estimates can be compared with those made by Naum Janny<sup>2/</sup>. He estimates an annual growth rate of 16.6 percent for the period 1947-1949. ORR estimates of civilian production show an annual growth rate of 18 percent for the period. If military production is included, the rate is slightly higher.

7. Several other preliminary conclusions and comparisons could be pointed out if time permitted. There will be elucidated in further discussion. Among the topics covered will be comparisons of USSR and USA growth rates by individual commodities, industrial sectors, and aggregate series. Also a more systematic treatment of the relationship between output and GNP growth rates will be presented.

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<sup>1/</sup> Norman Kaplan, Soviet Capital Formation and Industrialization, Rand P-77, p.30ff.  
<sup>2/</sup> Ibid., p. 63